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Original Article

Normalizing Vision: The Representation and Use of Spectacles and Eyeglasses in Victorian Britain

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ABSTRACT

This study explores the representation and use of Victorian visual aids, specifically focusing on how the design of spectacle and eyeglass frames shaped ideas of the 'normal' and 'abnormal' body. It contributes to our understanding of assistive technologies in the Victorian period by showcasing the usefulness of material evidence for exploring how an object was produced and perceived. By placing visual aids in their medical and cultural context for the first time, it will show how the study of spectacle and eyeglass frames develops our understanding of Victorian society more broadly. Contemporaries drew upon industrialization, increasing education, and the proliferation of print to explain a rise in refractive vision 'errors'. Through exploring the design of three spectacle frames from the London Science Museum's collections, this study will show how the representations and manufacture of visual aids transformed in response to these wider changes. The material evidence, as well as contemporary newspapers, periodicals, and medical texts, reveal that visual aids evolved from an unusual to a more mainstream device. It argues that visual aids are a unique assistive technology, one that is able to inform our understanding of how Victorians measured the body and constructed ideas of 'normalcy' and 'abnormalcy'.

KEYWORDS: Assistive technology, stigma, fashion, design, normalization, material culture.

In February 1885, the *Aberdeen Weekly Journal* reviewed a paper under the heading 'The Evils of Our School System'. Dr Dyce Davidson, Professor of Material Medica at Aberdeen University, argued that mass education had contributed to 'the great increase in the use of spectacles':

> It is not many years ago . . – even within my own memory – that spectacles were supposed to be necessary only to those of mature years, and indeed were looked upon as the first warning of declining age. A few also were compelled to wear them, chiefly those who were very short-sighted, but their numbers were so small that they were marked as peculiar, and attracted in our attention as a person afflicted with a deformity of body or limb.[1]

Whilst Davidson could not give exact figures for spectacle use, he argued that an optician had calculated a ninefold increase in spectacle sales during the last five years. Davidson was

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1 'The Evils of Our School System', *Aberdeen Weekly Journal*, 18 February 1885, in *19th Century British Library Newspapers* [accessed 5 June 2016].

writing at a critical and well-documented moment in contemporary debates about education and overpressure.[2] Much less well-documented is how these debates, and Davidson's observations, contributed to an equally critical moment in the history of visual aids. The press and specialized works discussed educational reform, growing medical knowledge and the acceptance of spectacles and eyeglasses as a corrective device extensively in the 1880s. This discussion was responding to and documenting a transition from a world where the use of a visual aid would have been considered odd or eccentric, to one that incorporated its use at both ends of the social spectrum.

In light of Davidson's reflections, this study focuses on how spectacle and eyeglass use became more widespread in the Victorian period. Through an exploration of design, it also analyses the implications of broadening usage on the perceptions of visual aids in contemporary newspapers and periodicals. To the Victorian wearer, a visual aid had two primary functions. First, it could be functional and improve the visual acuity of its wearer using optical lenses. Second, it could be an accessory or prop associated with a range of social and cultural meanings that emerged from its changing usage. This study will explore two primary types: spectacles and eyeglasses, a form of frame without side-arms. It will use the term 'visual aids' when discussing these devices as a whole, and spectacles and eyeglasses when the discussion is design-specific. By the Victorian period, visual aids existed in several different forms and had been readily available to all classes for two centuries. Collectors have documented the evolution of spectacle and eyeglass design extensively and highlight that they were becoming a more practical device.[3] In particular, the invention of spectacle side arms in the 1720s acted as a catalyst for developing a number of different frames.[4] Additionally, improvements in manufacture, which allowed the side arms to develop in flexibility and strength so that they sat more comfortably and tightly behind the ear, enabled eyeglasses to achieve a better fit. While few historians have considered the broader implications of these changes, Alun Withey's isolated study of the mid-eighteenth century has documented how the introduction of steel and other decorative polished metal frames influenced the growing visibility of spectacle usage.[5] The retail of these increasingly visible devices evolved alongside the move to shop premises in nineteenth-century retail, including shops that sold scientific instruments, jewellery, watches, and sundry goods. Both the design and location of sale influenced the variety available to the Victorian consumer and the materials used for spectacle and eyeglass frames, which ranged from the more elaborate gold, silver, mother of pearl and tortoiseshell, to the more utilitarian steel. The broadening market range of visual aids improved the accessibility of the devices. Yet it also allowed visual aids to exist in a number of different contexts as a scientific – and later medical – instrument, decorative or fancy good and miscellaneous item.

The Victorian visual aid was different to the forms and types of spectacles and eyeglasses that preceded it; they were mass produced, obtained for pennies, and increasingly more functional. From the 1850s, ophthalmologists determined the refractive condition of the eye and

2 See, for example, Amelia Bone, Melissa Dickson, Sally Shuttleworth and Jennifer Wallis, *Anxious Times: Medicine & Modernity in Nineteenth-Century Britain* (Pittsburgh, PA: University of Pittsburgh Press, 2019), pp. 149–80.

3 See, for example, *Ophthalmic Antiques Collectors Club Bulletin* (East Chillington: The Club, 1982–1985), and *The Newsletter: Ophthalmic Antiques International Collectors Club* (East Chillington: The Club, 1985–present); also see fn 6.

4 'Eighteenth century spectacles', <https://www.college-optometrists.org/the-college/museum/online-exhibitions/virtual-spectacles-gallery/eighteenth-century-spectacles.html> [accessed 6 December 2018].

5 Alun Withey, *Self-Fashioning and Politeness in Eighteenth-century Britain: Refined Bodies* (Basingstoke: Palgrave Macmillan, 2016), pp. 91–112.

could therefore observe and determine the degree to which lenses could improve a person's visual acuity for a range of eye conditions. Spectacles were not only within reach of all classes, they were now considered indispensable, necessary. Victorians celebrated the utility of both optical lenses and vision. Several scholars have noted the uniqueness of the Victorian environment for expanding the role of vision in conducting everyday activities.[6] The primacy of vision in Victorian environments demanded an unprecedented level of visual acuity. By implication, urban space, compulsory education, and vision testing in the railway and shipping industries elevated the problem of lower visual acuity and the role of visual aids as a 'solution'. While, as Withey has shown, the eighteenth century foregrounded the fashion for certain frames and the usability of spectacle frames through the introduction of side arms, the Victorians designed a range of frames in response to growing understandings of their effectiveness in improving a person's vision for a broadening number of uses, public spaces and users.

The dominance of object-focused studies by collectors has limited our ability to explore the social and cultural meanings of visual aids and collectors' work has been isolated from broader historical debates.[7] The study of visual aids is both enriched by and contributes to a range of fields in the Victorian period, including the history of medicine and disability history. Studying spectacles and eyeglasses in their cultural and medical context provides an alternative approach to the history of visual aids. Such an approach also informs our understanding of these topics and how Victorians perceived corrective devices. Historians have begun to expand their study of prosthetics to incorporate a multitude of assistive devices, including hearing aids and trusses, and this study follows this trend.[8] It also intersects a range of additional areas of historical inquiry. The Victorians' measurement of vision influenced, and sheds new light on, a number of changing nineteenth-century environments – such as schools, cities and the workplace – as well as societal and cultural changes, which included the rise in print, industrialization, and increased leisure time. This study will show how the design of visual aids altered in response to these changes and therefore allows the historian to explore Victorian responses to physical difference and stigma more broadly.

Objects still remain a vital source for the history of visual-aid design and were the starting point for this study. This article draws on visual aids from the London Science Museum's collections, which due to their size and scope allow key changes in frame and lens shape to be tracked. Over 1000 spectacles and eyeglasses have been handled to ascertain how design changed, as well as the potential causes and motivations behind this.[9] This study will reflect on three different types of frame: the uniform steel wire frame, the 'invisible' frame, and the decorative frame. Yet material culture is not simply the study of 'things' and historical

6 Chris Otter, *The Victorian Eye: A Political History of Light and Vision in Britain, 1800–1910* (Chicago, IL: University of Chicago Press, 2008), pp. 24–28; Rosemarie Garland-Thomson, *Staring: How We Look* (Oxford: Oxford University Press, 2009), p. 26; Kate Flint, The Victorians and the Visual Imagination (Cambridge: Cambridge University Press, 2000), p. 8.

7 For a comprehensive study by a collector, see William Rosenthal, *Spectacles and Other Vision Aids: A History and Guide to Collecting* (San Francisco, CA: Norman, 1996). Also see the Online Exhibitions produced by the The College of Optometrists <https://www.college-optometrists.org/the-college/museum/online-exhibitions.html> [accessed 10 August 2020].

8 See, for example, Graeme Gooday and Karen Sayer, *Managing the Experiences of Hearing Loss in Britain, 1830–1930* (Basingstoke: Palgrave Macmillan, 2017).

9 For more information on research methodology and the use of material culture, see Gemma Almond, 'Why the Anonymous and Everyday Objects are Important: Using the Science Museum's Collections to re-write the History of Vision Aids', *Science Museum Group Journal*, 13 (Spring 2020) <http://journal.sciencemuseum.ac.uk/browse/issue-13/the-history-of-vision-aids/> [accessed 1 August 2020].

studies have contextualized their research of an 'object' or 'artefact' by exploring a number of additional forms of evidence. As argued by Matthew McCormack in his study of Georgian footwear, the significance of an object can be learnt through textual sources and this study has similarly incorporated newspapers, periodicals, business records, and medical texts. Yet McCormack also has highlighted that the object itself was able to 'perform cultural work'.[10] Karen Harvey illustrates that previously worn objects allow the historian to explore both the physical wearing experience, as well as cultural representations.[11] In a similar manner, visual aids did not just have practical value in the Victorian period and, beyond their ability to correct vision, they embodied a range of social meanings for their wearers including status, fashion and intelligence. The London Science Museum's collections are vital for exploring these meanings. The material experience of spectacle and eyeglass wear influenced the use of visual aids and is reflective of how Victorians perceived them.

1. NORMALIZING VISION

In examining changes in frame design, this study argues that visual aids were a unique assistive device by the time that Davidson was writing in the 1880s, because, whilst they still could be stigmatized, they were mass produced and, in a short space of time, had become a commercial commodity. To help explain this argument, this article will engage with the theories of normalization and passing. The growing use of statistics and the measurement of the body heavily influenced Victorian understandings of ability and disability. Lennard J. Davis identified the period between 1840 and 1860 as transformative in the identification and conceptualization of the 'norm'.[12] Diagnosis, statistics and standards shaped the degrees and extent of what was considered normal and Ian Hacking, for example, described the preceding period, 1820 to 1840, as an 'avalanche' of numbers.[13] More recently, Coreen McGuire has exposed the role of objective diagnostic tools in both gathering and shaping these medical statistics and the expected standards and parameters of bodily measurement in the inter-war period.[14] Technology was equally important to the Victorian and these trends in measuring the body closely follow the history of vision testing, where the invention of the ophthalmoscope by Helmholtz in 1851 – an instrument that enabled individuals to look inside the eyeball – transformed contemporary understandings of the physiology of the eye.

Medical practitioners and opticians utilized diagnostic technologies to quantify and measure the visual acuity of the Victorian eye against a 'standard' for the first time. The standard eye was the emmetropic or 'normal' eye. Whilst the emmetropic eye was 'perfectly formed', the ametropic eye was a term used to describe the eye that was 'out of measure', not 'exact' or 'abnormal'.[15] The diagnosis and measurement of the eye accentuated older forms

[10] Matthew McCormack, 'Boots, Material Culture and Georgian Masculinities', *Social History*, 42 (2017), 461–79 (463–65).

[11] Karen Harvey, 'Men of Parts: Masculine Embodiment and the Male Leg in Eighteenth-Century England', *Journal of British Studies*, 54 (2015), 797–821 (820); McCormack, 'Boots, Material Culture', 464.

[12] Lennard J. Davis, *Enforcing Normalcy: Disability, Deafness and the Body* (London: Verso, 1995), p. 24.

[13] Ian Hacking, 'Biopower and the Avalanche of Printed Numbers', *Humanities in Society*, 5 (1982), 279–95.

[14] Coreen McGuire, *Measuring Difference, Numbering Normal: Setting the Standards for Disability in the Interwar Period* (Manchester: Manchester University Press, 2020).

[15] See, for example, William Mackenzie, *A Practical Treatise on the Diseases of the Eye*, 4th edn (London: A. and G. A. Spottiswoode, 1854), pp. 904, 924 and the seminal work by F. C. Donders, *On the Accommodation and Refraction of the Eye, with a Preliminary Essay on Physiological Dioptrics*, trans. by William Daniel Moore (London: New Sydenham Society, 1864).

of stigma that had been associated with visual-aid wear, including age and deficiency. Visual aids were increasingly associated with the 'abnormal' eye, whose defects were increasingly seen as disabling and negatively affecting a person's quality of life. Yet the standard itself was arbitrary. Georges Canguilhem has argued that conflating the 'normal' with the 'average' in medicine is problematic; the adoption of 'norms' in the historical measurement of the body does not reveal physical norms but instead says somewhat more about the social norms and expectations of society at any given time.[16] Similarly, 'normal' vision was not reflective of the average Victorian eye and the number of vision 'errors' that emerged in the wake of greater testing alarmed contemporaries. Instead, 'emmetropia' met the needs of its time, a degree of vision perceived to be suitable for functioning in the 'modern' world and one that could allow practitioners to compare and quantify people's vision. Improved diagnosis not only revealed deviations from standard vision, it also allowed practitioners to determine a 'natural' or 'normal' process of aging, akin to grey hair and 'wrinkled skin': 'Presbyopia', which described the almost universal stiffening of the eye's lens and subsequent inability to read smaller print with age.[17] Visual defects were corrected therefore not just as 'abnormalities', but as a response to the 'normal' process of deterioration associated with ageing.

The demand for the 'correction' of 'natural' and 'abnormal' conditions, coupled with improved manufacturing techniques, transformed both the usability and perceptions of visual aids. At first glance, the diagnosis and measurement of the eye is a good example for exploring Lennard J. Davis's model of normality; the creation of a problem led to the measurement of individuals who were subsequently placed on a spectrum dependent on how far they differed or deviated from the ascribed 'normal'.[18] Additionally, the development of visual standards allowed a person to be measured and 'corrected' so that they were able to conform or meet the 'normal' standard. However, visual aids also complicate the straightforward narrative of normalization and although visual aids enabled a person to meet the desired standard, they did not mask visible difference. The devices advertised the state of a person's vision and it was not possible to differentiate between the 'abnormal' refractive vision 'error' and the more 'natural' condition of presbyopia. This in turn, highlighted the number of vision defects that might have previously 'passed', a term used to describe a person's ability to successfully disguise a lack of conformity.[19] Whilst visual aids might have hindered a person's ability to pass, improved medical knowledge and mass production increased the number and accessibility of those available. In this context, the design of spectacles and eyeglass frames becomes important. Different frames reveal the material changes in frame design, and how this reflected the perceptions, representations and usability of visual aids in the Victorian period. First, the study of a steel wire frame shows how visual aids became more uniformly designed and widely produced, even normalized, despite the fact that they were being used to treat certain conditions that were persistently associated with abnormality. Second, two frame types – the 'invisible' and the elaborate – highlight that, whilst stigma could still exist, growing usage

[16] Georges Canguilhem, *The Normal and the Pathological* (New York, NY: Zone Books, 1991).

[17] Johann Friedrich Horner, *On Spectacles: Their History and Uses* (London: Balliere, Tindall & Cox, 1887), pp. 12–13. For another example, see Robert Brudenell Carter, *Eyesight: Good and Bad: A Treatise on the Exercise and Preservation of Vision*, 2nd edn (London: Macmillan, 1880), p. 76.

[18] Davis, *Enforcing Normalcy*, pp. 23–49; Lennard J. Davis, *The End of Normal: Identity in a Biocultural Era* (Ann Arbor, MI: University of Michigan Press, 2013), pp. 1–2, 5.

[19] Erving Goffman, *Stigma: Notes on the Management of Spoiled Identity* (London: Penguin Books, 1990), pp. 64–67, 92–113; *Disability and Passing: Blurring the Lines of Identity*, ed. by Jeffrey A. Brune and Daniel J. Wilson (Philadelphia, PA: Temple University Press, 2013), p. 1.

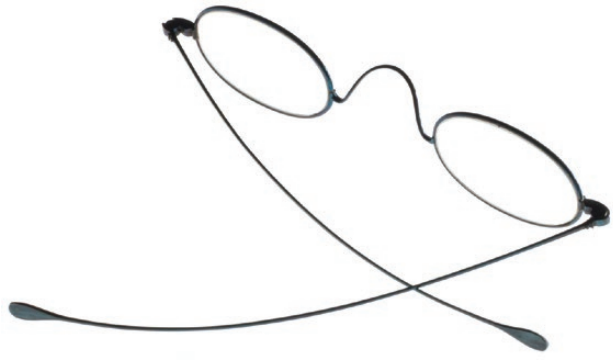

Figure 1. Steel wire spectacle frame.[20] With permission from SSPL/Science Museum.

allowed visual aids to become a more mainstream device. The materiality of visual aids helps to explain how perceptions and usage changed in this period. In doing so, the materiality of visual aids highlights how the growing normalization of spectacle and eyeglass wear challenged the very concept of 'normal' vision that the Victorians had created.

2. MASS PRODUCTION AND USE: THE STEEL WIRE SPECTACLE FRAME

The manufacture of visual aids helps us to explore the realities of spectacle and eyeglass wear and assess whether their usage altered in this period. Manufacture of both spectacles and eyeglass frames transformed across the century and arguably, the greatest change took place in the manufacture of steel.

A number of steel wire spectacle frames with straight or hooked side arms, similar to the one in Figure 1, can be found in the London Science Museum's Ophthalmology collection. Similar to other assistive devices and prosthetics, the development of the steel wire arm responded to broader developments in manufacture, which developed away from the bespoke handmade frame.[21] Patents are able to illustrate this change and reveal how steel manufacture evolved from casting and stamping to apparatus that was able to create thin wire.[22] Its scale was equally innovative. Visual aids were increasingly produced in factories and sold via wholesale houses. This did not lead to the complete deskilling or mechanization of the process; evidence of frame makers, for example, can be seen in Charles Booths' notebooks in the 1890s for the London firm, Curry & Paxton.[23] In contrast, it can be seen as part of the wider re-organization of the scientific instrument trade, which had become increasingly subdivided and produced by piece-work.[24] Sheffield-based opticians, Chadburn and Sons, illustrate this change and in 1851 were producing 12,000 lenses a week. By 1894, Chadburn reflected that few transformations 'are more striking' than the role of the spectacle maker in the second

[20] London Science Museum's Ophthalmology collection, object number A681340, *c.* 1820–1950, SSPL/Science Museum.

[21] See, for example, Alex Faulkner, 'Casing the Joint: The Material Development of Artificial Hips' in *Artificial Parts and Practical Lives: Modern Histories of Prosthetics*, ed. by Katherine Ott, David Serlin and Stephen Mihm (New York, NY: New York University Press, 2002), pp. 199–226.

[22] See, for example, John and Charles Greaves, Patent Number 1775, 15 August 1854.

[23] London School of Economics, Booth/A/11: Charles Booth's notebook, pp. 78–80.

[24] Ben Russell, *James Watt: Making the World Anew* (London: Reaktion Books, 2014), pp. 13, 57–8, 65; Evidence of piecework for spectacle frames can be found in Booth/A/11, p. 36.

half of the nineteenth century.[25] The scale of manufacture and the creation of a more uniform 'ready-made product' proposes two possibilities. First, that there was considerable demand for visual aids by the Victorian period, and second, that much larger quantities were available for the first time.

The steel wire hook side frame in Figure 1 highlights how the function of visual aids altered in response to these changes. Greater knowledge of refractive conditions of the eye and improved manufacturing techniques were necessary for achieving a frame and lens that was suitable for more permanent wear. In 1900, a text that was published by *The Optician* concluded that the 'hook' and 'straight' side frames 'were to be preferred in all cases where the glasses are to be worn constantly'.[26] The development of steel wire frames can be seen as part of the desire to achieve greater comfort and make visual aids lighter. An analysis of the London Science Museum's collections revealed that the newer straight wire spectacle frames were 53% of the weight of older sheet-casted metal or tortoiseshell designs.[27] Achieving this light frame was important so that frames could be used continuously without intermission or discomfort.[28] Beyond lightness, manufacturers and wearers alike desired to achieve comfort through a secure fit. The diagnosis of a greater range of refractive conditions, and the ability to prescribe with greater accuracy, meant that medical practitioners discussed, and retailers advertised, spectacle use for a broadening number of activities. As evidenced in 1880 by English ophthalmologist Robert Brudenell Carter, a frame now needed to enable a person 'to run, ride, dance or perform any other movements, without the glasses becoming displaced'.[29] Not all designs were secure and remained parallel on the face by the end of the Victorian period, but the development of 'hook' and 'straight' side arms led to designs that could be used during more physical activities, as well as for more traditional use in close-work.

Innovations in the manufacture of steel developed a better-fitting frame at a much lower cost. Whilst the average cost of visual aids continued to fluctuate, a broader market range was available from the 1820s and retailers consistently sold steel spectacle and eyeglass frames at 20d. or below. Mechanization and increasing demand can help to explain the reduction in the cost of steel visual-aid frames.[30] However, it is also possible to explore how expectations of who should wear and have access to visual aids altered across the period in response to these changes. Visual aids were markers of class and advertised dependent on the prospective user's social status.[31] Advertisements of visual aids featured in a number of local and national newspapers, as well as being found across the diverse range of periodicals that Victorians consumed. The language used in these advertisements reveals a widening market that encompassed a range of consumers. For the first time, advertisements specifically targeted the lower classes. In 1868, for example, Abraham & Co. advertised 'Spectacles for the Humbler Classes, 1s 6d and 2s 6d per pair'.[32] In 1887 the *Wrexham Advertiser* advertised 'the

[25] Sheffield City Archives, SY231: *Observations on the Choice and Use of Spectacles*, 11th edn (1894), back page and p. 8.

[26] R. J. Phillips, *Spectacles and Eyeglasses, Their Forms, Mounting and Proper Adjustments*, 2nd edn (The Optician and Photographic Trades Review, 1900), pp. 40–49.

[27] Based on the weight of 201 steel and tortoiseshell frames and 131 steel wire frames in the London Science Museum's Ophthalmology collection.

[28] See, for example, *The Optician*, 25 February 1892, p. 368.

[29] Carter, *Eyesight: Good and Bad*, p. 253.

[30] See, for example, Horner, *On Spectacles*, p. 5.

[31] For similar findings, see Heather R. Perry, 'Re-Arming the Disabled Veterans: Artificially Rebuilding State and Society in World War One Germany', in *Artificial Parts and Practical Lives*, ed. Katherine Ott, David Serlin and Stephen Mihm, pp. 75–102.

[32] 'Abraham & Co.', *The London Reader: of Literature, Science, Art and General Information*, 28 November 1868, 121, in *British Periodicals* [accessed 30 June 2016].

working man's spectacle' and in 1888 an optician advertising in the *Leicester Chronicle* highlighted that there were 'special terms for the working classes'.[33]

The advertisement of 'common spectacles' indicates that there was a demand for spectacles for as little as 6d. in areas as divergent as Bristol and Dundee.[34] It also reveals the growing need to supply visual aids to a broader proportion of the population. In 1876, literary critic Richard Hengist Horne commented on the newfound benefits of lenses in relation to 'modern' society. He concluded:

> The real second sight of modern man is a good pair of spectacles. They are at once the re-juvenescence of the eye, the preservative of the most important organ.[35]

To the Victorian contemporary, 'modern' society included urban living, mass education, the increase in print, and a range of occupations that demanded close work in poor lighting conditions. From their perspective, all of these contributed to the deterioration of the nation's overall visual acuity. In 1871, 10 years before Davidson reported a 'great increase in spectacles', a column in a weekly periodical reflected on the number of spectacle wearers and questioned how 'former generations managed to get on without them'.[36] From the 1880s the increasing diagnosis of refractive conditions caused alarm in the nineteenth-century popular press. The press attributed this rise to an increase in medical knowledge, as well as the changing Victorian environment and wider concerns about public health. The requirement of 'normal' vision in occupations such as railways highlighted the value of the visual aid to meet the demands of this changing society. Spectacles were perceived as a 'basic right' for the elderly in poor-law inspections, but they were also considered necessary for children to access schools and adults to access work.[37] The London Spectacle Mission was founded in 1896 to ensure that individuals could obtain a visual aid when they 'may be deprived of their means of livelihood by failing eyesight'.[38] The scale of charity in the Victorian period varied from the London Spectacle Mission's ability to relieve 500 individuals a year, to the Royal London Ophthalmic Hospital's annual expenditure of £135 3s. 6d. on the provision of spectacles and artificial eyes.[39]

The growing utility of lenses to correct refractive conditions of the eye positively influenced the growing provision of visual aids. In addition, it provides evidence for the growth in expected users of visual aids; they were conceived as a basic 'serviceable' device that was marketed for the poor. Additionally, Victorians used spectacles for a more extended period,

[33] 'Messrs Francis', *The Wrexham Advertiser, and North Wales News*, 26 March 1887; 'R.W. Mason', *The Leicester Chronicle and Leicestershire Mercury*, 7 January 1888, in *19th Century British Library Newspapers* [accessed 5 June 2016].

[34] 'Thomas Sale', *Bristol Mercury*, 21 March 1846; 'Samuel Lees', *Dundee Courier & Argus*, 30 June 1883, in *19th Century British Library Newspapers* [accessed 15 June 2016].

[35] 'Eyes and Eyeglasses: A Friendly Treatise', *Fraser's Magazine*, December 1876, 689–722, in *British Periodicals* [accessed 30 June 2016].

[36] 'Table Talk', *Once a Week*, 20 May 1871, 504, in *British Periodicals* [accessed 30 June 2016].

[37] The National Archives, MH 12/11000/19: Spectacles for aged inmates, 4 April 1853, folio 47; The National Archives MH 12/9534/77: From the Harry Farnall, Poor Law Inspector of Southwell workhouse, 30 October 1867, folios 105–7; For adults and children, see London Metropolitan Archives, A/KE/B/01/04/004: Royal London Ophthalmic Hospitals, Complaint that there was little profit in supplying spectacles, letters dated 1 November 1889, 12 May 1899, 20 November 1900.

[38] London Metropolitan Archives, A/FWA/C/D/223/001: Two Newspaper Clippings: The Spectacle Mission Society, undated.

[39] London Metropolitan Archives, A/FWA/C/D/223/001: Two Newspaper Clippings: The Spectacle Mission Society, undated; London Metropolitan Archives, A/KE/B/01/04/004: Complaint that there was little profit in supplying spectacles' charities, letter dated 18 October 1900.

and for activities that would have been more public. This transformation altered the space and place of visual-aid usage. While it is impossible to measure its scale, case accounts published in medical texts on vision and the eye between 1853 and 1900 reveal that boys between the ages of seven and 15, girls between the ages of eight and 18, and both men and women between the ages of 20 and 81 were wearing visual aids in the second half of the century.[40] Coupled with the evidence of mass manufacture, medical knowledge, and vision testing, it suggests that – in terms of class, age, and gender – there were a range of potential visual-aid users by the time Davidson commented on 'The Evils of Our School System' in 1885.

3. STIGMA AND FASHION: REPRESENTATIONS OF THE RIMLESS AND DECORATIVE FRAME

Davidson proposed that the increasing use of visual aids over the course of the century positively altered perceptions towards them; spectacle wearing was no longer 'peculiar'. Certainly, from the 1850s, the design of spectacles and eyeglass frames diversified and appeared in a range of more popular forms as a result of the growing demand and locations of visual-aid retail. Indeed, the popularity of eyeglasses enabled a style of visual aid to become 'fashionable'. Yet spectacles have a history of both positive and negative social markers before and during their growing use in the Victorian period. These contrasting developments are traceable when comparing two differing eyeglass designs from the London Science Museum's collection: a pair of 'invisible' eyeglasses and a pair of decorative eyeglasses. By exploring the perceptions of, and modifications to, eyeglass frames it is possible to see how an increase in the use of visual aids had created a device that was more mainstream and commercialized. Nevertheless, the contrasting perceptions of visual aids indicate the development of two distinctly different frame designs in the mainstream market: one that was 'invisible' and aimed to conceal and one that was striking and intended for display. These designs suggest that responses to visual aids were actually twofold; they were a stigmatized necessity because of their association with 'abnormality' as well as deemed 'normal' and adopted, even chosen, as an accessory.

Visual aids, as assistive devices, were still subject to different forms of stigma, something that Davidson's assessment fails to capture. Stigma is evident in Figure 2, which shows a pair of

Figure 2. A Pair of rimless eyeglasses.[41] With permission from SSPL/Science Museum.

[40] Based on the analysis of 11 medical texts with case studies between 1853 and 1900.

[41] London Science Museum's Dunscombe collection, object number 1921-323/375, SSPL/Science Museum.

rimless clip eyeglasses, with oval lenses and gold plaquets from the London Science Museum's Dunscombe collection. The rimless frame was first made in spectacle form between *c*. 1825 and 1840, and the earliest rimless frame in the London Science Museum's collections dates from 1844.[42] However, the term 'rimless' was not adopted in this period and they were marketed and described as 'invisible'. By the 1870s, 'invisible' frame designs proliferate in both the London Science Museum's collections and advertisements.[43] Whilst these 'invisible' styles were reflective of improved manufacture and the ability to create thin wire, they also reflected a person's wish to pass and hide their defect. Rimless frames provide a new perspective on the desire to produce more realistic prosthetics in this period, which can be particularly seen in the development of artificial limbs.[44] Additionally, the rimless frame shows how both a conventional visual aid would draw attention to abnormality of vision, and, because of the perceived need to rectify this, the potential stigma that surrounded eyeglass wear and refractive conditions of the eye.

The association of visual aids with negative social markers helped drive the desire for discreetness. Spectacles were a visible marker of defective eyesight and, according to a newspaper account in 1850, a 'badge of infirmity' or a 'badge of disgrace'.[45] Alun Withey has shown how spectacles had started to move away from their association with deficiency in the eighteenth century.[46] However, the development of medical knowledge and the establishment of ophthalmology in the nineteenth century furthered the association between spectacles, poor vision and deficiency. In particular, myopia was often described with terms such as 'feeble' and 'weak', and the condition was perceived to affect the overall health of the individual, even permanently disfiguring them through stooping to examine objects close up.[47] This association could negatively influence a person's ability to obtain employment and was particularly discussed from the 1880s when medical men realized the effectiveness of visual aids. Whilst lenses – similar to other assistive devices and prosthetics – helped improve a person's capacity for work, medical men discussed how social barriers and prejudice could supersede their practical function.[48]

Stigma evolved and transformed throughout the course of the Victorian period. The need to be discreet was not straightforward and was dependent on, and influenced by, the style of frame. Modifications to the design of eyeglasses between the 1850s and 1870s enabled them to become the style of choice and increased the visibility of visual aids in public space. Spectacles in 1891, for example, were considered for 'hours of privacy', whilst eyeglasses were 'for use before the public'.[49] As a result, and in marked contrast to 'invisible' frames, a number

[42] London Science Museum's Optics collection, object number 1931-789; for more information on rimless frames see 'Nineteenth century spectacles', <https://www.college-optometrists.org/the-college/museum/online-exhibitions/virtual-spectacles-gallery/nineteenth-century-spectacles.html> [accessed 6 December 2018].

[43] London Science Museum's Optics collection, object numbers 1921-323/373–376; See, for example, 'Thos Harris & Son', *Daily News*, 10 September 1877 and 'Francis', *The Wrexham Advertiser and North Wales News*, 26 March 1887, in *19th Century British Library Newspapers* [accessed 5 June 2016].

[44] Claire L. Jones, 'Introduction', in *Rethinking Modern Prostheses in Anglo-American Commodity Cultures*, ed. by Claire L. Jones (Manchester: Manchester University Press, 2017), pp. 1–23.

[45] 'Spectacles, from The Quarterly Review', *Trewman's Exeter Flying Post or Plymouth and Cornish Advertiser*, 1 August 1850, in *19th Century British Library Newspapers* [accessed 10 May 2016].

[46] Withey, *Self-Fashioning and Politeness*, pp. viii, 6, 109.

[47] Priestley Smith, *Short Sight in Relation to Education* (Birmingham: The Midland Educational Company, 1880), pp. 12, 20–21; see also examples in popular print: 'How we see, hear and speak', *The Leisure Hour*, January 1889, 64, in *British Periodicals* [accessed 30 June 2016].

[48] For an example in the popular press see, 'Our Eyes and Our Industries', *Freeman's Journal and Daily Commercial Advertiser*, 19 March 1887, in *19th Century British Library Newspapers* [accessed 10 May 2016]; For discussion on the association of prosthetics with work efficiency, see Perry, 'Re-Arming the Disabled Veterans', pp. 75–102.

[49] 'Over the Teacups', *The Academy*, 10 January 1891, 33, in *British Periodicals* [accessed 30 June 2016].

Figure 3. A decorative handfolder made from gold.[51] With permission from SSPL/Science Museum.

of elaborate eyeglass frames existed in the Victorian period and came to be considered 'fashionable'.[50]

The handfolder made from gold in Figure 3 – a form of eyeglass which folds into a handle – highlights how non-functional features could drive the design of visual-aid frames. This is most evident in medical and popular discussion of eyeglasses. Although less practical – primarily because of their inability to stay securely on the face – they were immensely popular. Moreover, the use of intricate detail and elaborate materials, including gold, silver, mother of pearl and tortoiseshell highlights that contemporaries viewed visual aids as an accessory. This is also telling in the context of retail, because jewellers and watchmakers often sold visual aids alongside brooches and other decorative items.[52]

Nevertheless, the elaborate design of visual aids cannot fully evidence their social acceptance. Decorations could form part of attempts to conceal and provide additional evidence of users' attempts to mask their assistive device. Stephen Mihm, for example, has discussed how the design of more 'life-like' artificial limbs was class-based and evolved in response to the importance of appearance in polite society.[53] Elaborate designs of visual aids were similarly class-based. However, unlike artificial limbs, visual aids could fully supplant their functional purpose and be used as an accessory or item for display. Reports of either the theatre or races in newspapers frequently commented upon the use of eyeglasses by the 'well dressed' and prominent members of society.[54] Positive social markers associated with eyewear – such as wealth, beauty and intellect – also influenced their use. Based on these, a desire to wear visual aids for purely

[50] See, for example, 'Spectacles', *Saturday Review of Politics, Literature, Science and Art*, 21 August 1880, 234–35, in *British Periodicals* [accessed 30 June 2016].

[51] London Science Museum's Ophthalmology collection, object number A681867, *c.* 1730–1860, SSPL/Science Museum.

[52] See 'James Wales', *Leeds Mercury*, between April 1840 and June 1841; 'Alfred W. Butt', *The Wrexham Advertiser and North Wales News*, 3 August 1895, in *19th Century British Library Newspapers* [accessed 10 May 2016].

[53] Stephen Mihm, 'A Limb Which Shall be Presentable in Polite Society: Prosthetic Technologies in the Nineteenth Century', in *Artificial Parts and Practical Lives*, ed. Katherine Ott, David Serlin and Stephen Mihm, pp. 282–99.

[54] See 'A Foreigner's description of Newmarket Races: from Travels of a German Prince', *Derby Mercury*, 4 April 1832; 'The Race Course Photographed', *The Sheffield and Rotherham Independent*, 14 September 1871, in *19th Century British Library Newspapers* [accessed 10 May 2016].

aesthetic reasons existed across the Victorian period. In 1850 it was commented that 'plain glass is the most harmless contrivance for those who insist upon looking through a window to avoid the simplicity of ungarnished eyes'.[55] Yet beyond improving general appearance, people adopted spectacles as well as eyeglasses for non-functional purposes and the social meanings they could portray. In 1880, discussion of spectacles in periodical literature reported that 'doctors and clergymen are especially partial to spectacles', even when they were not required, because they were able 'to lend gravity to their looks and enable them to pass for sages amongst the ignorant'.[56]

Gender further complicates the increasing use of, and changing perceptions towards, Victorian visual-aid use. Unlike other assistive devices and protheses, the design of both spectacles and eyeglass frames was not overtly gendered or marketed as such.[57] Only in a few limited instances did advertisements for certain frame designs specifically target ladies, for example, because of their particular lightness or ability to not 'disarrange' the hair.[58] In contrast, the representations of visual aids were more overtly gendered and this helps to further explain the growing diversity in styles available. Depictions of eyeglasses in popular print were often satirical. For men, the eyeglass had become synonymous with the dandy in this period and promoted an image of effeminacy. In 1871, a satirical image in *Fun*, entitled 'A Man of Standing', mocked the perceived delicacy of the male eyeglass wearer.[59] It contrasted the strength of a man entitled 'sea legs' with the eyeglass wearer who was struggling to stand in what was presented as a light breeze.

Despite effeminate satire, it was women that medical and popular discourse discussed when considering the influence of stigma on discouraging spectacle usage. For women, eyeglasses were appropriate as a fashionable accompaniment to an outfit, not as a functional device. Spectacles were to be avoided. This is not to say that only women refrained from using visual aids. Case accounts published in medical texts on vision detail that both men and women could have a 'strong prejudice' and delayed using lenses, and visiting a medical practitioner, even when required.[60] However, women featured more prominently in these discussions and could be excused from wearing visual aids for functional purposes. For instance, in 1864 Dutch ophthalmologist, Franciscus Cornelis Donders, stated that in some cases concave lenses need not be used when they are required, and 'women particularly have a right to be allowed some liberty in the matter'.[61] Donders's reasoning was based on the effect that spectacles had on women's appearance and in 1880, an article headed 'Ladies in Spectacles' similarly concluded that they were not 'becoming'.[62] The negative association between women and spectacle wearing culminated in a number of jokes that were printed

[55] 'Spectacles, from The Quarterly Review', footnote 18.

[56] 'Literary extracts – Spectacles and Chess', *The Hull Packet and East Riding Times*, 18 June 1880, in *19th Century British Library Newspapers* [accessed 10 May 2016].

[57] Ryan Sweet, '"Get the Best Article in the Market": Prostheses for Women in Nineteenth-Century Literature and Commerce', in *Rethinking Modern Protheses in Anglo-American Commodity Cultures*, ed. Claire L. Jones, pp. 114–36.

[58] See, for example, *Ipswich Journal*, 3 June 1854. *Liverpool Mercury*, regularly between 10 March 1864 and 6 August 1864 and accessible via the British Library 19th century newspapers database, <https://go.gale.com/ps/start.do?p=BNCN&u=uows> [accessed: 16 March 2021].

[59] 'A Man of Standing', *Fun*, 13 August 1879, 61, in *British Periodicals* [accessed 30 June 2016].

[60] See, for example, the cases of William White Cooper quoted in Walter Alden, *The Human Eye; its Use and Abuse* (Cincinnati, OH: The Author, 1866), pp. 42, 55.

[61] Donders, *On the Accommodation and Refraction of the Eye*, p. 190. Similar thoughts were expressed earlier in the century by one of the founders of ophthalmology in Europe: Georg Beer, *The Art of Preserving the Sight Unimpaired to an Extreme Old Age; and of Re-establishing and Strengthening it When it Becomes Weak* (London: Henry Colburn, 1815), p. 130.

[62] 'Ladies in Spectacles', *Aberdeen Weekly Journal*, 25 August 1880, in *19th Century British Library Newspapers* [accessed 30 June 2016].

in newspapers and periodicals in the 1890s. Here, eyewear was used as a prop when women were discussing their 'rights', social freedom or education.[63] These jokes suggest that the campaign for women's rights could be undermined through the use of visual aids, which were able to represent women as masculine and make bookishness appear eccentric. This evidence shows that prejudices and fashions depended on the wearer, style and function of the visual aid. The use of spectacles by men bolstered their intelligence, whereas women's use of eyeglasses was appropriate as a fashionable accessory. In contrast, the use of eyeglasses for show by men could be considered effeminate, whilst the use of spectacles for functional purposes by women could be satirized. By exploring visual aids in this way, the 'invisible' eyeglasses in Figure 2 become an interesting form of material evidence; in the Victorian period there was still a demand for concealment regardless of an ability to be accepted or fashionable.

The variability in frame design and the prominence of eyeglasses and/or spectacles at public events and in newspapers and periodicals make visual aids different to other prosthetics and assistive devices. Visual aids had a number of social meanings and were not just associated with their intended function to improve vision. Moreover, the growing acceptance of visual aids is evidenced in their use to conceal or disguise other forms of physical difference, including artificial noses or early forms of assistive hearing devices.[64] The use of visual aids to disguise other corrective devices highlights their greater ubiquity and could be explained by the 'natural' and almost universal need for lenses in old age to correct presbyopia, which was discussed by Davidson. This 'natural' need had negative implications of its own and people could dislike spectacles for making people appear 'old' or aged.[65] The association with age was similarly gendered; men discussing the aging effects of spectacles when worn by women, for example, feature prominently.[66]

Whether perceived positively or negatively, the acknowledged ubiquity and fashion of visual aids amongst certain demographics increasingly normalized visual-aid use. Regardless of function, visual-aid wear became increasingly more prominent in a number of public spaces. Moreover, as acknowledged by Davidson at the outset of this article, contemporaries also observed the expanding use of visual aids, beyond the elderly. The use of visual aids for states of the eye that contemporaries deemed both 'natural' and 'abnormal', the problem of gender, and the range of social perceptions, help to explain the existence of two contrasting designs. Spectacles and eyeglasses in both elaborate and discrete forms indicate the need to accommodate a diverse, and growing, range of users for a range of different functions. A visual aid by 1885 had become more mainstream; it was a useful aid at the racecourse, an accessory to an outfit, and a functional device that enabled a person to continue work or study.

4. CONCLUSION

The diagnosis of refractive conditions of the eye, the subsequent establishment of 'abnormal' and 'normal' vision and the increase in mass production altered the use and perception of visual aids. In purely functional terms, visual aids would have transformed the lives of their

63 See, for example, 'Quips and Cranks', *The North-Eastern Daily Gazette*, 25 July 1894; 'Scraps', *Aberdeen Weekly Journal*, 10 April 1895, in *19th Century British Library Newspapers* [accessed 5 June 2016].

64 See, for example, Arthur S. Underwood, 'An Artificial Nose Affixed Without Spectacles', *Lancet*, 2 May 1896, p. 1232.

65 See, for example, Thos Harris & Son, *A Brief Treatise on the Eyes, Defects of Vision, and the Means of Remedying the Same by the Use of Proper Spectacles* (London: Onwhyn, 1839), p. 17.

66 See, for example, 'Eyes and Eyeglasses: A Friendly Treatise', footnote 27; women acknowledging this opinion are also mentioned by John Browning, *Our Eyes and How to Preserve Them from Infancy to Old Age*, 7th edn (London: Chatto & Windus, 1887), p. 36.

users. However, they do not easily fit in the broader context of prosthetics and assistive devices, and the theory of normalization. Most prosthetics or assistive technologies are functional devices that help their users to conform to the idealized 'norm'. Visual aids, on the other hand, embodied a range of social meanings and emphasized a person's inability to conform. The corrective technology itself allowed a person to achieve 'normal' vision, yet the device became a central and obvious feature of the face.

Davidson proposed that perceptions of visual aids had altered in response to a 'great increase' in wearers, and that the use of a visual aid was no longer considered 'peculiar' in comparison to a deformity of limb or other visible markers of physical difference. By exploring the materiality of spectacle and eyeglass frames, this study has shown that such a narrative is too simplistic. The perceptions of visual aids did not always correlate with the numbers used, and new forms of stigma emerged with the increasing visibility of visual aids in public spaces. However, visual aids did become more mainstream. The popular press described eyeglasses, and sometimes spectacles, as 'fashionable' in a number of different contexts that associated visual-aid use with intellect, beauty, wealth and status. In response to this, a number of frame designs proliferated, and negative or positive social perceptions were based on a combination of the visual-aid style and the specific user. The association of visual aids with the elderly or learned in contemporary print and satire demarcates their usage in a way that simultaneously recognized that they were 'acceptable' for use among certain populations and 'unacceptable' for others, for whom they may convey an unappealing 'bookishness' or premature old age.

Comment on wearers that did not conform to the traditional stereotypes highlights that the users of visual aids were broadening beyond these groups. The mass manufacture of visual-aid frames complicates the normalization of vision when the device intended to remedy 'abnormality' was increasingly becoming normalized in Victorian Britain. Whilst ophthalmologists reinforced the 'emmetropic' eye as the 'normal eye', the use of lenses to correct both refractive vision 'errors' and presbyopia highlighted the frequency of both 'natural' and 'abnormal' differences in vision. Victorians continued to use this terminology, but it was critiqued in the 1890s. In 1899, correspondence in the *British Medical Journal*, for example, rejected the testing of children's vision against a national average because 'normal is a variety'.[67] This finding is not isolated to the measurement of vision. Alison Matthews David's study of tailoring in nineteenth-century France has shown that the new templates, based on mathematical and medical norms, did not fit the bourgeois and left them 'wanting'.[68] In contrast, visual aids do not directly challenge what was conceived as 'normal', because the standard used to measure vision has remained unchanged. However, it does challenge how 'normal' vision was understood and, akin to Canguilheim's theorization, reveals more about the expectations of Victorian society rather than the reality of the Victorian body. Visual aids by their very nature highlighted the frequency of 'abnormality' and challenged the relationship between 'norm' and 'normative'. Perhaps, as stated in the *British Medical Journal* in 1899, the artificial standard was the 'ideal' as opposed to the 'normal'. Improved diagnosis, the popularization of the device and the frequency of variation caused contemporaries to question the use of these categories and also the newfound demands on ocular capacity in the Victorian world.

[67] 'The Vision of School Children', *British Medical Journal*, 25 March 1899, 763, in *BMJ: British Medical Association* [accessed 1 August 2016].

[68] Alison Matthews David, 'Made to Measure? Tailoring and the 'Normal' Body in Nineteenth-century France', in *Histories of the Normal and the Abnormal: Social and Cultural Histories of Norms and Normativity*, ed. by Waltraud Ernst (London: Routledge, 2006), pp. 142–164.

Waltraud Ernst argued that 'any statement that proceeds from a description of the 'normal' to a prescriptive assertion of standards or norm needs to be probed carefully'.[69] The perception, manufacture, and adoption of visual aids in Victorian Britain exposes this. The increasing use of visual aids highlights the importance of commonality in the normalization of an assistive device. Yet the fact that the visual aid had become more mainstream also highlights that, although an incomplete process, 'normal' was not necessarily normative and 'abnormality' was not necessarily stigmatized. Indeed, visual aids have the potential to expose how faster transport methods, new occupations, education and changing pastimes in the Victorian period placed a new demand on the eye that could not be met without assistance.

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[69] Waltraud Ernst, 'The Normal and the Abnormal: Reflections on Norms and Normativity', in *Histories of the Normal and the Abnormal*, pp. 1–25.